Acreage Living

July 2009 www.extension.iastate.edu/acreage/

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Acreage Living is published monthly. Please share it with your acreage neighbors. Call your local ISU Extension Office for more information or contact an ISU Extension staff member listed below to suggest topics for future articles.

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Protect Stream Banks and Ponds with Vegetation

By Jesse Randall, ISU forestry specialist, and Rich Clayton, ISU fisheries specialist

Iowans can implement low-cost yet high-yield solutions to improve stream and pond quality and aesthetics on their properties. Some estimates place the number of farm and acreage ponds in Iowa in excess of 90,000. Many acreage owners find a pond or stream on their property is a source of pride, enjoyment and can add to the property's value. This interface between water and soil can also be a source of long-term problems if not managed properly.

Ponds

Acreage owners use ponds for a variety of reasons including swimming, fishing and ice skating. Properly managed ponds will yield years of enjoyment. The largest single problem that an Iowa pond owner faces is balancing nutrient inputs. With proper vegetation management these nutrients can be partially captured on land, which can greatly reduce midsummer pond vegetation problems. In Iowa, phosphorous and nitrogen additions are the primary nutrients that affect pond health. These additions are not solely due to agricultural runoff. Some is "urban" runoff from lawn fertilization, grub and weed control, as well as the vegetation cut by mowers.

Five inexpensive options can control or limit sources of unwanted nutrients. Leave a grass "filter" strip that is mowed annually (to control woody growth) rather than weekly. Infrequent mowings will help slow overland water flow, which carries phosphorous and nitrogen as well as silt directly into the pond.

Canada geese are a major source of nutrients in ponds and can be the direct cause for midsummer algae blooms. Limit local geese populations

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by leaving a tall grass strip along the edge of your pond. Canada geese prefer areas that allow them to see approaching predators. A tall grass strip near the water's edge will not be attractive to them.

If mowing is desired, begin mowing close to the pond after the major spring weather has passed. Then limit the number of mowings and set the mower at a higher setting. Blow grass clippings onto the land rather than into the water. As grass clippings decay, they are a source of nutrients acting as a fertilizer.

Use the small contour differences around the pond to reduce inputs particularly if you can identify where overland water enters the pond. These areas are "hotspots" where grass should be left unmowed or mowing is limited as described above. The width of the filter strip can vary depending on the topography and the watershed extent. Our recommendation is to make it as wide as you can without compromising other activities.

If all mowing is discontinued, woody vegetation encroachment will occur over time. Landowners can control the type and density of woody vegetation by strategically planting beneficial trees and shrubs. Woody vegetation can shade areas of the pond to help control temperature and sunlight (influencing pond vegetation), provide habitat cover for wildlife and songbirds, increase pond bank stabilization and provide the homeowner added privacy.

Streams

Recent research has begun to focus on in-stream flow and the impacts of active stream bank erosion. Acreage owners often do not own enough of the stream length to realize large downstream changes in water quality. However, they can take steps to limit siltation and nutrient inputs. When multiple adjacent acreage owners combine efforts, improvements can help the overall stream health.

One of the first improvements is livestock control. In Iowa, livestock are often in pasture areas adjacent to streams. Restricting livestock from the stream area will allow vegetation (grasses and woody vegetation) to establish and begin to hold the stream bank. In severe cases, where stream banks have begun to erode creating steep bank situations, a more direct conservation approach is needed.

Stream revetments are one simple method landowners can create by themselves with tools and materials common on most acreages. Stream revetments are structures that slow the water, which reduces the stream's power and causes the stream to add silt in strategic areas that can then be planted with fast growing vegetation such as willows, buttonbush and various sedges. A revetment can also modify the stream bank slope so it can handle the energy from large water flow events.

Figures 1-3 illustrate a before, just following a flood event, and two-month follow-up of a local stream bank revetment project that was installed as part of an Iowa State University class. The project began by anchoring 7 to 10 foot tall red cedar trees (top of the tree pointing downstream) with several wraps of wire to old T-posts that were driven into the stream bed where the bank meets the water. Trees were overlapped to create a continuous row. During floods, sediment was deposited behind the cedar trees, which added to the bank. Willow and buttonbush shrubs were planted in these silted areas. Figure 2 shows that grasses and forbs have begun to grow and further stabilize the bank and "hide" the once open bank face. Once established, revetments need only minor maintenance -- cutting back the willows in the first few years to stimulate root growth and expansion of the trees. These 12-16 inch cuttings, if clipped in early spring before bud break, can be driven directly into the soil bank (leaving 1-2 inches above the soil surface) where they will root and grow into new seedlings.

In time, these revetments will grow and expand to create wildlife corridors, help moderate stream temperatures, and improve the stream's capacity for aquatic life. For more information, see Iowa State's natural resource ecology and management extension site at www.nrem.iastate.edu/extension/

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Figure 1. Looking downstream. Red cedar revetment is on the left side of the stream. Picture taken April 14, 2009.

Figure 2. Looking across the revetment (bottom of the photo is the bank, top of the photo is the middle of the stream). Over two feet of sediment was deposited from an April 26, 2009 rain storm. Photo was taken was taken on April 28. Note the two T-posts used to secure the base and top of each cedar tree and the willow cuttings just sticking out just above the sediment.

Figure 3. Looking upstream. Red cedar revetment is on the right side of the stream. Picture taken June 19, 2009. Note vegetation regrowth to the right of the revetment along the bank is hiding the willow cuttings from Figure 2.

Septic Systems: Out of Sight -- Out of Mind -- and Out of Pocket

By Tom Glanville, ISU Professor of Ag and Biosystems Engineering

They are usually out of sight— so are easily forgotten — but septic systems do need maintenance, and failing to do it can lead to costly repairs.

Septic systems have two main components: a tank — whose main purpose is to trap floating solids and sludge; and a soil or sand filter (variously referred to as soil absorption trenches, leaching field, buried sand filter, filter mound or occasionally a mechanical treatment unit). The filter reduces bacteria and soluble pollutants in septic tank effluent before the liquid is discharged into the soil (preferred) or (when soils are not suitable) into a ditch or stream.

The most important maintenance task on the tank component of the system is to have it checked and pumped out periodically. Though chemical and bacterial action inside the tank help to break down solids, the rate of decomposition is generally too slow to keep up with the amount coming in, and so a gradual

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buildup of solids is to be expected. If the tank is allowed to fill with solids, then these damaging particles will be flushed into the filter/disposal component of the system, causing plugging — followed by development of wet areas in the disposal area — and ultimately requiring costly excavation and reconstruction.

The frequency of tank pumping varies with size of the tank, population of the household discharging into the tank, and whether or not a garbage disposal (which increases the rate of solids loading on the tank) is used. Guidelines (http://www.nesc.wvu.edu/pdf/ww/septic/pl_fall04.pdf) published by Pennsylvania State University suggest that a 750 gallon tank serving a household of three people should be pumped approximately every 2.6 years, while a 1,000 gallon tank serving the same size household is predicted to need pumping every 3.7 years. If the household size increases to six persons, recommended pumping frequencies for the above tank sizes increase to 1.0 and 1.5 years respectively. If a garbage disposal discharges into the septic system, more frequent pumping will probably be necessary.

Be sure to ask the technician to check the condition of septic tank baffles each time the tank is pumped. Baffles help to retain solids inside the tank. The highly corrosive environment inside the tank can damage the baffles, resulting in a continuous and damaging discharge of solids.

The benefits of using special additives to maintain or restore septic tank performance continue to be debated by product vendors, researchers and environmental health officials (http://www.nesc.wvu.edu/pdf/ww/septic/additives_sfqw02.pdf). While some research has identified possible benefits, other work has found some additives to be detrimental. New products continue to be developed and marketed, and most experts agree further research is needed. According to information posted on the website of the USEPA – funded National Environmental Services Center at West Virginia University, "Claims made on the effectiveness of additives to either eliminate pumping of a septic tank or restore permeability of soil absorption systems are unsubstantiated. No product will allow a homeowner to escape a regular septic tank pumping and maintenance schedule."

As noted above, several different types of soil/sand filters are used in Iowa to further treat household sewage before discharging it into the soil or a nearby water course. Maintenance on these so-called "secondary" treatment devices varies, but many depend on gravity drainage to deliver septic tank effluent to and throughout the secondary treatment area. Gravity flow control devices, often called distribution boxes, splitter boxes, drop boxes, or dosing siphons, rely on perfectly level installation to split the sewage flow and evenly distribute it across the surface area of trenches or filter beds. If the splitter box becomes unlevel — due to poor installation, settling, frost heave or lawn maintenance equipment traffic — much of the flow may be directed into a small portion of the treatment area, causing local overloading, wet areas and plugging of soil or sand. To avoid this problem, the splitter box should be checked periodically to ensure that it is level and not obstructed by solids.

For further information on septic system design, installation and maintenance, contact your local county environmental health sanitarian, the Iowa Department of Natural Resources (http://www.iowadnr.gov/water/septic/index.html), or check out the excellent publications posted on the Septic Systems page of the National Environmental Services Center (http://www.nesc.wvu.edu/subpages/septic.cfm).